

B. Amendments to the claims

1. (Currently amended) A hard carbon material having a density greater than 2.3 g/cm³ and a hardness from 1.0 Gpa to 50 Gpa formed by the process of:
 - a) providing a fullerene based carbon powder comprising at least 99% single walled nanotubes,
 - b) agglomerating said fullerene based carbon powder to a density above 1.4 g/cm³;
 - c) subjecting said fullerene based carbon powder to a pressure of 1.0 to 10.0 Gpa, a temperature of from 300-1000°C for a period of time from 1 to 10000 seconds.

Claims 2-3. (Cancelled)

4. (Currently amended) The carbon material as claimed in claim 1, wherein the fullerene based powder comprises at least 99.9% fullerenes-single walled nanotubes.
5. (Original) The carbon material as claimed in claim 1, wherein the pressure is at least 2.5 GPa, the temperature is at least 500°C, and the period of time is at least 1000 seconds.
6. (previously amended) The carbon material as claimed in claim 1, wherein the fullerene based powder comprises 0.0001 to 1.0% of a dopant to effect the electrical

properties of the material.

7. (Original) The carbon material as claimed in claim 6, wherein the dopant is selected from the group consisting of hydrogen, boron, nitrogen, oxygen, sulphur, fluorine, and chlorine.

8. (Currently amended) A process for forming a high density sintered conductive carbon material, having a hardness from 1.0 Gpa to 50 Gpa, comprising the steps of:

- a) providing an fullerene based carbon powder having at least 99% fullerenes 99.9% by weight of single walled nanotubes,
- b) agglomerating said fullerene based carbon powder to a density above 1.4 g/cm³;
- c) subjecting said fullerene based carbon powder to pressure of 1.0 to 10.0 Gpa, a temperature of from 300-1000°C for a period of time of from 1 to 10000 seconds.

Claims 9-11 (Cancelled)

12. (Currently amended) The process as claimed in claim 21 11, wherein the alloys are based on at least one of Ni, Fe and Co.

Claim 13 (Cancelled)

14. (Original) The process as claimed in claim 8, further including the steps of infiltrating said fullerenes by superplastic flow under temperature and pressure into a porous composite material and said subjecting step takes place after said fullerene based carbon powder has been infiltrated into the porous material.

15. (Original) The process as claimed in claim 14, wherein the superplastic flow takes place at temperatures of 200-400°C at pressures of 0.1-1.0 Gpa.

16. (Previously amended) The process as claimed in claim 8, wherein the fullerene based carbon powder comprises 0.0001 to 1.0% of a dopant to effect the electrical properties of the material.

17. (Currently amended) A conductive hard, high density carbon material comprising fullerenes at least 99.9% by weight of single walled nanotubes subjected to heat, temperature and pressure sufficient to provide a hardness to the material of at least 1.0 Gpa and less than 50 Gpa with a resistivity of less than 10 ohms-cm and a density above 2.3 g/cm³.

Claims 18-19 (Cancelled).

20. (Currently amended) The material as claimed in claim 17, wherein the fullerenes include further including 0.0001 to 1.0% of a dopant to effect the electrical properties of

the material.

21. (New) A process for forming a high density sintered conductive carbon material, having a hardness from 1.0 Gpa to 50 Gpa, comprising the steps of:

- a) providing an fullerene based carbon powder having at least 99.9% buckyballs
- b) agglomerating said fullerene based carbon powder to a density above 1.4 g/cm³;
- c) subjecting said fullerene based carbon powder to pressure of 1.0 to 10.0 Gpa, a temperature of from 300-1000°C for a period of time of from 1 to 10000 seconds;
- d) providing an alloy used to convert carbon materials to diamond, and
- e) subjecting said carbon material to a pressure of 7.0 to 9.0 Gpa, a temperature of from 800-1300°C for a period of time from 0.1 to 100 seconds to convert the carbon material to polycrystalline diamond.

22. (New) A process for forming a high density sintered conductive carbon material, having a hardness from 1.0 Gpa to 50 Gpa, comprising the steps of:

- a) providing an fullerene based carbon powder having at least 99.9% buckyballs
- b) agglomerating said fullerene based carbon powder to a density above 1.4 g/cm³;
- c) subjecting said fullerene based carbon powder to pressure of 1.0 to 10.0 Gpa, a temperature of from 300-1000°C for a period of time of from 1 to 10000 seconds;
- d) providing a metal alloy selected form the group comprising aluminum,

magnesium and calcium alloys; and

e) subjecting said carbon material to a pressure of 2.5 to 9.0 Gpa, a temperature of from 400-1300°C for a period of time from 10 to 1000 seconds to convert the carbon material to monocrystalline diamond.

23. (New) A process for forming a high density sintered conductive carbon material, having a hardness from 1.0 Gpa to 50 Gpa, comprising the steps of:

- a) providing an fullerene based carbon powder having at least 99% fullerenes,
- b) agglomerating said fullerene based carbon powder to a density above 1.4 g/cm³;
- c) infiltrating said fullerenes by superplastic flow under temperature and pressure into a porous composite material; and
- d) subjecting said infiltrated composite material to pressure of 1.0 to 10.0 Gpa, a temperature of from 300-1000°C for a period of time of from 1 to 10000 seconds.